PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

News Media Information 202 / 418-0500
Fax-On-Demand 202 / 418-2830
TTY 202 / 418-2555
Internet: http://www.fcc.gov
ftp.fcc.gov

DA 02-1779
July 25, 2002

THE FCC'S ADVISORY COMMITTEE FOR THE 2003 WORLD RADIOCOMMUNICATION CONFERENCE APPROVES DRAFT PROPOSALS

On July 22, 2002, the World Radiocommunication Conference Advisory Committee (WRC-03 Advisory Committee) adopted recommendations to the Commission on numerous issues that the 2003 World Radiocommunication Conference (WRC-03) will address. The WRC-03 Advisory Committee was established by the Commission in January 2001 to assist it in the development of proposals for WRC-03. To that end, the WRC-03 Advisory Committee has forwarded the recommendations it has developed since the beginning of 2001 to the Commission for consideration. We have attached to this Public Notice the WRC-03 Advisory Committee's recommendations, which are in the form of recommended draft proposals to the WRC-03. We appreciate the substantial amount of work that the WRC-03 Advisory Committee has put into developing its recommendations. This Public Notice requests comments on all of these recommendations.

Based upon our initial review of the recommendations forwarded to the Commission, the International Bureau, in coordination with other Commission Bureaus and Offices, tentatively concludes that we can generally support all of the proposals recommended by the WRC-03 Advisory Committee. We do, however, have some reservations about the proposals reflected in documents WAC/126, WAC/127 and WAC/129. We seek comment on the recommendations that appear in all of the WRC-03 Advisory Committee documents and on our tentative conclusions.

In addition, the National Telecommunications and Information Administration (NTIA) has submitted letters to the Commission containing draft proposals that have been developed by the Executive Branch Agencies. We also request comment on these draft proposals, which are attached hereto as well.

The FCC will consider the draft proposals and comments provided in its upcoming consultations with the U.S. Department of State and NTIA in the development of U.S. proposals to WRC-03. Once agreed by these agencies of the U.S. Government, proposals will be used by U.S. delegations at bilateral, regional and international meetings. The draft proposals attached to this Public Notice may evolve as we approach WRC-03 and during the course of interagency discussions. Therefore, they do not constitute the final national position on these issues.

The complete texts of these draft proposals are also available in the FCC's Information Reference Center, Room CY-A257, 445 12th Street, SW, Washington, DC 20554 and by accessing the FCC's WRC-03 world wide web site at http://www.fcc.gov/wrc-03. To comment on the proposals, please submit an original and one copy of your comments to the Office of the Secretary, Federal Communications Commission, 445 12th Street, SW, Washington, DC 20554 and provide a courtesy copy to Alex Roytblat, FCC WRC-03 Director, Room 6-B505. Comments should refer to specific proposals by document number. The deadline for comments on the draft proposals and NTIA letters is **August 16, 2002**.

I. Informal Working Group 2: Mobile-Satellite Service including GPS

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/126(22.07.02)

WRC-03 Agenda Item 1.16: to consider allocations on a worldwide basis for feeder links in bands around 1.4 GHz to the non-GSO MSS with service links operating below 1 GHz, taking into account the results of ITU-R studies conducted in response to Resolution 127 (Rev.WRC-2000), provided that due recognition is given to the passive services, taking into account No. S5.340

Background Information

A total of only l.525 MHz (space-to-Earth) and l.9 MHz (Earth-to-space) are presently allocated on a worldwide primary basis to the MSS below l GHz, and 300 kHz (Earth-to-space) is allocated for land MSS on a worldwide primary basis. These allocations are for both the MSS service links and MSS feeder links. Since these allocations were made at WARC-92 and WRC-95, the Radiocommunication Bureau has identified 25 non-GSO MSS networks at frequencies below l GHz at some state of coordination and 9 non-GSO MSS networks at the advance publication stage only. Yet it appears that many of the proposed networks cannot be implemented in the existing allocations, because there is not enough spectrum readily available in the allocated spectrum bands. Additional feeder link spectrum outside of the currently allocated bands would provide dedicated feeder link spectrum and free up existing allocations for scarce service link spectrum.

WRC-97 approved Resolution 127 to study sharing techniques for NVNG MSS < 1 GHz feeder links (Earth-to-space) in the 1390-1400 MHz band and space-to-Earth feeder links in the 1427-1432 MHz band. Sharing studies completed in the ITU-R under Resolution 127 with respect to the proposed allocation of spectrum for space-to-Earth feeder links (1429-1432 MHz) include: (a) protection of the radioastronomy service by controlling out-of-band emissions to meet Recommendation RA.769-1 levels of -255 dB ($W/m^2/Hz$) for the 1400-1427 MHz band; (b) protection of EESS by meeting Recommendation SA. 1029-1 requirements of -171 dBW/27MHz for in-band pfd levels; and (c) sharing with fixed and mobile services on the basis of not exceeding the pfd levels established for sharing in the adjacent bands of -146 $dBW/m^2/4$ kHz (since no level had been established for the 1429-1432 MHz band). Sharing studies that have been completed with respect to the proposed allocation of spectrum for Earth-to-space feeder links include:
(a) protection of EESS by meeting Recommendation SA.1029-1 requirements of -171 dBW/27MHz for in-band pfd levels; and (b) sharing with the radiolocation service by equipping the non-GSO MSS satellites with adequate filtering. Protection of the radioastronomy service at nearby frequencies can be achieved by geographic separation of MSS uplinks from radioastronomy sites. In addition, sharing with the fixed, mobile, and passive services will be dependent on the characteristics of the respective services.

As a result of the favorable initial studies in these bands, WRC-00 placed on the proposed agenda for WRC-03 (subsequently approved by the ITU Council) Agenda Item 1.16, to consider allocations at 1390-1393 MHz for Earth-to-space feeder links and 1429-1432 MHz for space-to-Earth feeder links for the non-GSO MSS service with the understanding that Resolution 127 studies

would be completed including testing of near-flight hardware to validate the theoretical studies approved earlier.

The U.S. proposes allocations in the 1390-1393 MHz (Earth-to-space) and 1429-1432 MHz (space-to-Earth) bands at WRC-03 for non-GSO MSS feeder links. The proposed allocations are in bands close to the passive services band at 1400-1427 MHz that must be protected from out-of-band and spurious emissions. Studies have shown that interference to radio astronomy and the other passive services can be avoided using various techniques including low-power transmitter levels, choice of modulation, symbol shaping, output filtering and band limiting filters, the use of which can minimize the band separation necessary to meet the recommended interference threshold levels for protection of these services. The U.S. expects that the hardware testing to be completed before WRC-03 will confirm the theoretical results already approved by the ITU-R for the protection of the passive services. The U.S. proposal for allocation of these bands to NGSO MSS feeder links follows.

Proposal:

USA/ /1
(MOD)

1 350-1 525 MHz

Allocation to services		
Region 1	**Region 2**	**Region 3**
1 350-1 400 FIXED MOBILE RADIOLOCATION 5.149 5.338 5.339 **ADD** 5.XXX **ADD** 5.XXXA	**1 350-1 400** RADIOLOCATION 5.149 5.334 5.339 **ADD** 5.XXX **ADD** 5.XXXA	
1 429-1 452 FIXED MOBILE except aeronautical mobile 5.341 5.342 **ADD** 5.YYY **ADD** 5.XXXA	**1 429-1 452** FIXED MOBILE 5.343 5.341 **ADD** 5.YYY **ADD** 5.XXXA	

Reason: To provide additional allocations for non-GSO MSS feeder links (Earth-to-space) and (space-to-Earth) to support existing non-GSO MSS service allocations below 1 GHz.

USA/ /2
(ADD)

5.XXX *Additional allocation:* the band 1390-1393 MHz is also allocated on a primary basis to the mobile-satellite service (Earth-to-space). This allocation is limited to feeder links for non-geostationary orbit mobile-satellite systems with service links below 1 GHz.

Reason: To provide additional allocations for non-GSO MSS feeder links (Earth-to-space) to support existing non-GSO MSS allocations below 1 GHz.

USA/ /3
(ADD)

5.XXXA The use of the bands 1390-1393 MHz and 1429-1432 MHz by the mobile-satellite service is subject to coordination under No. **9.11A**.

Reason: To provide protection to other primary services in the bands while enabling the additional allocations to the mobile-satellite service feeder links.

USA/ /4
(ADD)

5.YYY *Additional allocation:* the band 1429-1432 MHz is also allocated on a primary basis to the mobile-satellite service (space-to-Earth). This allocation is limited to feeder links for non-geostationary orbit mobile-satellite systems with service links below 1 GHz.

Reason: To provide additional allocations for non-GSO MSS feeder links (space-to-Earth) to support existing non-GSO MSS allocations below 1 GHz.

II. Informal Working Group 4: Fixed Service/Fixed-Satellite Service Sharing

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/087rev1(22.07.02)

WRC-03 Agenda Item 1.25: to consider, with a view to global harmonization to the greatest extent possible, having due regard to not constraining the development of other services, and in particular of the fixed service and the broadcasting-satellite service, regulatory provisions and possible identification of spectrum for high-density systems in the fixed-satellite service above 17.3 GHz, focusing particularly on frequency bands above 19.7 GHz

Background Information:
The demand for broadband services is increasing. Market research predicts substantial growth in demand for broadband multi-media access, both for residential and business applications. Satellite systems offer an attractive competitive alternative to terrestrial communication systems for providing such access.

High-density systems in the fixed-satellite service (HDFSS systems) may use any orbital type (GSO or non-GSO) consistent with the FSS allocation. As envisioned in technical and operational studies, HDFSS systems incorporate small, ubiquitous, low-cost earth stations that can be deployed rapidly and flexibly. As a consequence of these general characteristics, it is not practicable to coordinate HDFSS earth stations with terrestrial services on an individual, site-by-site basis.

While sharing between Fixed Service (FS) stations and non-ubiquitous FSS earth stations can typically be handled through proven case-by-case coordination procedures, the most effective use of the spectrum within a given country where high-density deployments of FSS stations are involved may be achieved by deploying HDFSS and FS systems separately. This enables both types of systems to provide the most efficient, least constrained, highest quality and lowest cost service to the greatest number of users.

Effective HDFSS earth station deployment is very difficult to achieve when site-by-site coordination between FS stations and HDFSS earth stations is required. Therefore, it is appropriate for administrations to authorize HDFSS earth stations under a regime whereby a large number of earth stations can be deployed without the need for individual earth station site coordination. Such authorization would not relieve an HDFSS network from the ITU requirements to coordinate with fixed service networks on a site-by-site basis, where required, across international borders, nor would it preclude coordination of specific earth stations within HDFSS deployments with fixed service networks.

A number of FSS systems with other characteristics, and with earth stations of types other than those used by HDFSS systems, have already been brought into use, or are planned to be brought into use, including some that use the 17.8–21.2 GHz (space-to-Earth) frequency band. Accordingly, it is essential that existing FSS allocations be retained and that non-HDFSS use of these FSS allocations not be subject to additional regulatory constraints in the Radio Regulations as a result of the HDFSS band identification. Further, identification of spectrum for HDFSS does not relieve an HDFSS network of the ITU requirement to coordinate with other satellite networks.

Consideration of candidate frequency bands for HDFSS identification

A number of frequency bands allocated to the fixed-satellite service are seen as good candidates for HDFSS identification. The 29.5–30.0 GHz and 19.7–20.2 GHz bands are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. Since there are no co-primary fixed service allocations in the ITU Table of Frequency Allocations in these bands, a major sharing issue is avoided.

The 28.6–29.1 GHz and 18.8–19.3 GHz frequency bands are allocated globally to the FSS in the Earth-to-space and space-to-Earth directions, respectively. These are the only bands considered for HDFSS where NGSO FSS systems are not subject to No. **S22.2** of the Radio Regulations, and therefore represent the best opportunity for ubiquitously deployed NGSO FSS user terminals. In these two bands, some administrations in all Regions have planned for HDFSS and have adopted regulatory provisions for terrestrial systems in order to facilitate HDFSS. Some HDFSS systems are already in development in these bands and there are other filings for HDFSS-type systems.

Many administrations are also planning to use the 18.58–18.8 GHz (space-to-Earth) band and the 28.35–28.6 GHz and 29.25–29.5 GHz (Earth-to-space) bands for HDFSS applications. In the 18.6-18.8 GHz band, the FSS allocation is co-primary with the Earth exploration-satellite service (passive) with restrictions on power and orbit types as described in **S5.522A** and **S5.522B**.

Between 37.5 and 50.2 GHz, many administrations have submitted ITU filings for FSS systems in the 40.0–42.0 GHz (space-to-Earth) and 48.2–50.2 GHz (Earth-to-space) bands and propose to use these bands for global HDFSS. WRC-2000 advised administrations that may be contemplating the use of the 40.5–42 GHz band for high-density applications in the fixed service (HDFS) to take into account constraints to HDFS due to the potential deployment of high-density applications in the FSS. Further, Resolution 84 (WRC–2000) urges administrations considering regulatory provisions relating to the 40.0–40.5 GHz band to take into account that there were a number of proposals to WRC–2000 to identify the band for HDFSS applications.

It is inappropriate to add or remove any fixed-satellite service allocations in the Table of Frequency Allocations under WRC–03 agenda item 1.25. This includes new FSS allocations in bands in which the fixed-satellite service is already allocated in another direction. In particular, new space-to-Earth FSS allocations in the 17.3–17.7 GHz, 21.4–22 GHz and 47.2–50.2 GHz bands, which have been discussed in working party meetings, should be rejected. Studies have shown that the latter band is not suitable for space-to-Earth links because of likely interference with both FSS gateway and HDFSS uplinks.

Description of proposal

This proposal identifies spectrum above 18.58 GHz for high-density systems in the fixed-satellite service without constraining the use of these bands by other FSS applications or other co-primary services. It specifically does not establish priority among the different uses of these bands. The proposal consists of a new footnote **S5.[HDFSS]** to frequency bands identified for high-density FSS systems, consequential modifications to existing footnote **S5.547**, and a new Resolution [HDFSS] providing guidance to administrations wishing to amend their national rules to implement high-density systems in the fixed-satellite service.

Proposal:

USA/ / 1
MOD

18.4-20.2 GHz		
Allocation to services		
Region 1	**Region 2**	**Region 3**
18.4–18.6	FIXED FIXED-SATELLITE (space-to-Earth) S5.484A MOBILE **ADD S5.[HDFSS]**	
18.6–18.8 EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) S5.522B MOBILE except aeronautical mobile Space research (passive) S5.522A S5.522C **ADD S5.[HDFSS]**	**18.6–18.8** EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) S5.522B MOBILE except aeronautical mobile SPACE RESEARCH (passive) S5.522A **ADD S5.[HDFSS]**	**18.6–18.8** EARTH EXPLORATION-SATELLITE (passive) FIXED FIXED-SATELLITE (space-to-Earth) S5.522B MOBILE except aeronautical mobile Space research (passive) S5.522A S5.522 **ADD S5.[HDFSS]**
18.8–19.3	FIXED FIXED-SATELLITE (space-to-Earth) S5.523A MOBILE **ADD S5.[HDFSS]**	
19.7–20.1 FIXED-SATELLITE (space-to-Earth) S5.484A Mobile-satellite (space-to-Earth) S5.524 **ADD S5.[HDFSS]**	**19.7–20.1** FIXED SATELLITE (space-to-Earth) S5.484A MOBILE-SATELLITE (space-to-Earth) S5.524 S5.525 S5.526 S5.527 S5.528 S5.529 **ADD S5.[HDFSS]**	**19.7–20.1** FIXED SATELLITE (space-to-Earth) S5.484A Mobile-satellite (space-to-Earth) S5.524 **ADD S5.[HDFSS]**
20.1-20.2	FIXED SATELLITE (space-to-Earth) S5.484A MOBILE SATELLITE (space-to-Earth) S5.524 S5.525 S5.526 S5.527 S5.528 **ADD S5.[HDFSS]**	

27.5–30.0 GHz		
Allocation to services		
Region 1	**Region 2**	**Region 3**
27.5–28.5	FIXED S5.5SSS FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE S5.538 S5.540 **ADD S5.[HDFSS]**	

28.5–29.1	FIXED FIXED-SATELLITE (Earth-to-space) S5.484A S5.523A S5.539 MOBILE Earth exploration-satellite (Earth-to-space) S5.541 S5.540 **ADD S5.[HDFSS]**	
29.1–29.5	FIXED FIXED-SATELLITE (Earth-to-space) S5.523C S5.523E S5.535A S5.539 S5.541A MOBILE Earth exploration-satellite (Earth-to-space) S5.541 S5.540 **ADD S5.[HDFSS]**	
29.5–29.9 FIXED SATELLITE (Earth-to-space) S5.484A S5.539 Earth exploration-satellite (Earth-to-space) S5.541 Mobile-satellite (Earth-to-space) S5.540 S5.542 **ADD S5.[HDFSS]**	**29.5–29.9** FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) S5.541 S5.525 S5.526 S5.527 S5.529 S5.540 S5.542 **ADD S5.[HDFSS]**	**29.5–29.9** FIXED-SATELLITE (Earth-to-space) S5.484A S5.539 Earth exploration-satellite (Earth-to-space) S5.541 Mobile-satellite (Earth-to-space) S5.540 S5.542 **ADD S5.[HDFSS]**
29.9–30.0	FIXED-SATELLITE (Earth-to-space) MOBILE-SATELLITE (Earth-to-space) Earth exploration-satellite (Earth-to-space) S5.541 S5.543 S5.525 S5.526 S5.527 S5.538 S5.540 S5.542 **ADD S5.[HDFSS]**	

40.0–42.0 GHz		
Allocation to services		
Region 1	**Region 2**	**Region 3**
40-40.5	EARTH EXPLORATION-SATELLITE (Earth-to-space) FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth) SPACE RESEARCH (Earth-to-space) Earth exploration-satellite (space-to-Earth) **ADD S5.[HDFSS]**	
40.5–41 FIXED FIXED SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile **MOD** S5.547 **ADD S5.[HDFSS]**	**40.5–41** FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile Mobile-satellite (space-to-Earth) **MOD** S5.547 **ADD S5.[HDFSS]**	**40.5–41** FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile **MOD** S5.547 **ADD S5.[HDFSS]**

41-42 FIXED FIXED SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile **MOD** S5.547 S5.551G **ADD S5.[HDFSS]**	**41-42** FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile **MOD** S5.547 S5.551G **ADD S5.[HDFSS]**	**41-42** FIXED FIXED-SATELLITE (space-to-Earth) BROADCASTING BROADCASTING-SATELLITE Mobile S5.551F **MOD** S5.547 S5.551G **ADD S5.[HDFSS]**

47.2–50.2 GHz	
Allocation to services	
47.2-50.2	FIXED **NOC** FIXED-SATELLITE (Earth-to-space) S5.552 MOBILE S5.149 S5.340 S5.552A S5.555 **ADD S5.[HDFSS]**

Reasons:

1. Consequential: see reasons associated with USA/xx/2 and USA/xx/3.

2. Studies have shown that HDFSS uplinks and HDFSS downlinks cannot share the same spectrum, and there are interference concerns about FSS gateway uplinks and HDFSS downlinks. Accordingly, it is proposed that there be no change to the FSS allocation directions in the 47.2-50.2 GHz band. The FSS allocation in this band is to be retained for uplink use only.

USA/ /2
ADD

S5.[HDFSS] The space-to-Earth fixed-satellite service bands 18.58-18.8 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, and 40.0-42.0 GHz and the Earth-to-space fixed-satellite service bands 28.35-28.6 GHz, 28.6-29.1 GHz, 29.25-29.5 GHz, 29.5-30.0 GHz and 48.2-50.2 GHz, are identified for use by high-density applications in the fixed-satellite service (HDFSS) in accordance with **Resolution [HDFSS] (WRC-03)**. This identification does not preclude the use of these bands by other fixed-satellite service applications or by other co-primary services allocated in these bands and does not establish priority among users of the bands in the Radio Regulations.

Reasons: The identification of appropriate frequency bands for high-density applications in the fixed-satellite service can help administrations and HDFSS satellite system operators in deployment of HDFSS earth stations. This footnote will also inform administrations of those specific bands intended for deployment of HDFSS systems in all regions of the world, while specifying that the use of these bands for HDFSS applications does not preclude their use by other co-primary services or by other FSS applications.

USA/ /3
MOD

S5.547 The bands 31.8-33.4 GHz, 37-40 GHz, 40.5-43.5 GHz, 51.4-52.6 GHz, 55.78-59 GHz and 64-66 GHz are available for high-density applications in the fixed service (see Resolutions **75 (WRC-2000)** and **79 (WRC-2000)**). Administrations should take this into account when considering regulatory provisions in relation to these bands. Because the band 40.5-42 GHz is identified for use by high-density applications in the fixed satellite service (see **No. S5.[HDFSS]** and Resolution **[HDFSS] (WRC-03)**), and thus is available for these applications, ~~Because of the potential deployment of high-density applications in the fixed-satellite service in the bands 39.5-40 GHz and 40.5-42 GHz,~~ administrations should further take into account ~~potential~~ appropriate constraints to high-density applications in the fixed service when considering regulatory provisions in relation to the latter type of applications in the same band~~, as appropriate~~ [(see Resolution **84 (WRC-2000)**)].

Reasons: Consequential to the addition of No. S5.[HDFSS] to the 40.5-42.0 GHz band, and the non-identification of 39.5-40.0 GHz for HDFSS use. *NOTE: The square brackets reflect that the fate of Resolution 84 has not yet been determined*.

USA/ /4
ADD

RESOLUTION [HDFSS] (WRC-03)

High-Density Applications in the Fixed Satellite Service in Frequency Bands Identified for HDFSS

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that demand has been increasing steadily for broadband communications services throughout the world;

b) that this demand for ubiquitous broadband communications services can be met in part through the use of high-density applications in the fixed-satellite service (HDFSS);

c) that HDFSS is an advanced broadband communications applications concept that enables telecommunications services to be provided on a flexible, wide-scale basis through standardized, relatively low-cost earth terminal equipment;

d) that HDFSS will provide users with access to a wide range of broadband telecommunications services supported by fixed telecommunications networks (including the Internet) and thus will complement other telecommunications systems;

e) that HDFSS offers great potential for developing countries to establish their telecommunications infrastructure more rapidly;

f) that HDFSS systems are characterized by flexible, rapid deployment, high frequency reuse, and ubiquitous deployment of large numbers of earth stations employing small antennas and having common technical characteristics;

g) that due to the large number and nature of terminals involved, it is not practicable for HDFSS earth stations to implement burdensome interference mitigation techniques,

noting

a) that No. **S5.[HDFSS]** identifies the space-to-Earth FSS bands 18.58-18.8 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, and 40.0-42.0 GHz and the Earth-to-space FSS bands 28.35-28.6 GHz, 28.6-29.1 GHz, 29.25-29.5 GHz, 29.5-30.0 GHz and 48.2-50.2 GHz, for high-density applications in the fixed satellite service (HDFSS);

b) that this identification does not preclude the use of these bands by other co-primary services or by other fixed-satellite service applications, and does not establish priority among users of the bands in the Radio Regulations;

c) that in some of the bands listed in *noting a)* above, the FSS allocations are co-primary with fixed and mobile service allocations;

d) that in the band 18.6-18.8 GHz, the FSS allocation is co-primary with the Earth exploration-satellite service (passive) with the restrictions of **S5.522A** and **S5.522B**.

e) that radio astronomy observations of an important spectral line are carried out in the 48.94-49.04 GHz portion of the 47.2-50.2 GHz band, and that such observations require continued protection wherever they occur worldwide;

f) that a number of FSS systems with other types of earth stations and characteristics have already been brought into use or are planned to be brought into use in some of the frequency bands identified for HDFSS in No. **S5.[HDFSS]**;

g) that HDFSS stations in these bands are expected to be deployed in large numbers over urban, suburban and rural areas of large geographical extent;

h) that harmonized worldwide bands for HDFSS would facilitate the implementation of HDFSS and maximize the extent to which users in administrations around the world would be able to benefit from global access and economies of scale,

recognizing

a) that as a consequence of their general characteristics, it is difficult and may be a rather long process to coordinate HDFSS earth stations on an individual site-by-site basis;

b) that the single authorization of a large number of FSS earth stations associated with a given satellite system, without the need for individual site coordination, would greatly facilitate the ability of fixed-satellite services to reach large numbers of users within a geographic area;

c) that such an authorization would minimize the administrative burden for administrations to individually authorize a large number of earth stations,

recognizing further

a) that FSS networks and systems implementing HDFSS applications are subject to all applicable provisions of the Radio Regulations, such as coordination and notification pursuant to Articles **S9** and **S11**, including any ITU requirements to coordinate with fixed service networks across international borders, and the provisions of Articles **S21** and **S22**;

b) that Article **S21** contains power flux density limits that protect fixed service receivers operating on a co-primary basis in the fixed-satellite service space-to-Earth bands identified in No. **S5.[HDFSS]**, thereby ensuring that transmissions from fixed-satellite service satellites will not cause unacceptable interference to fixed service receivers operating in these same bands;

resolves

to urge administrations implementing HDFSS in some or all of the corresponding frequency bands in No. **S5.[HDFSS]** to:

a) consider using a single authorization for a large number of earth stations having common technical characteristics and associated with a given satellite system;

b) consider taking into account the relevant technical characteristics, as identified by ITU-R Recommendations (e.g., Recommendations ITU-R S.524-7 and [doc. 4/70]);

c) take into account that continued assignment of spectrum to or deployment of terrestrial stations in bands identified for HDFSS within the same geographical area could impede the introduction or development of HDFSS and reduce or eliminate the benefits that such applications offer;

d) ensure compatibility with, and not constrain, other existing and planned fixed-satellite service systems having different characteristics, particularly those that use the frequency band 17.8-21.2 GHz (space-to-Earth),

invites administrations

to give due consideration to the benefits of harmonized utilization of the spectrum for HDFSS on a global basis, taking into account the use and planned use of these bands by all other services to which these bands are allocated, as well as other types of fixed-satellite service applications.

Reasons: Many administrations are currently in the process of determining how to appropriately provide for HDFSS services in their countries. Some of these administrations are looking to the ITU for guidance on spectrum management issues concerning the FS and HDFSS and this Resolution provides that guidance.

III. Informal Working Group 5: 5 GHz, 13.75-14 GHz and Maritime Issues

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/127(22.07.02)

WRC-03 Agenda Item 1.24: to review the usage of the band 13.75 - 14.0 GHz, in accordance with Resolution **733 (WRC-2000)**, with a view to addressing sharing conditions;

Background information

Prior to WRC-2000, footnote **S5.502** contained constraints such as e.i.r.p. and antenna size limits on fixed-satellite service earth stations and e.i.r.p. limits on the radiolocation service. Footnote **S5.503** contained e.i.r.p. limits on the fixed-satellite service to protect the space research service. These constraints were intended to accommodate a delicate sharing of the band among these services. These constraints were developed based upon agreements reached at WARC-92 and applied to subsequent sharing studies on the planned use of 13.75-14.0 GHz by geostationary satellites in the FSS, and were intended to limit the number of FSS earth stations to the point that sharing could occur, though a potential for interference from the limited number of earth stations would still exist. Since the time that the regulatory constraints were developed, GSO FSS operators have expressed interest in operating small earth stations. This is due to the increased requirement for broadband data services delivered to businesses, hospitals, schools, etc., in both rural and urban areas. Radiolocation operators have expressed interest in using higher than currently allowed e.i.r.p. values. WRC-2000 modified footnotes **S5.502** and **S5.503** to include:

- within footnote S5.502 that the protection of the receiving space stations in the FSS operating with earth stations that, individually, have an e.i.r.p. of less than 68 dBW shall not impose constraints on the operation of the radiolocation and radionavigation stations operating in accordance with the Radio Regulations.
- within footnote S5.503 that the e.i.r.p. density of emissions from any earth station in the FSS operating with a space station in the geostationary satellite orbit shall not exceed 71 dBW in the band 13.772 to 13.778 GHz until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band; that the e.i.r.p. density of emissions from any earth station in the FSS operating with a space station in non-geostationary satellite orbit shall not exceed 51 dBW in the band 13.772 to 13.778 GHz until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band.

Resolution **733 (WRC-2000)** invites the ITU-R "to conduct studies, as a matter of urgency and in time for consideration by WRC-03, on the sharing conditions indicated in Nos. **5.502** and **5.503**, with a view to reviewing the constraints in No. **5.502** regarding the minimum antenna diameter of GSO FSS earth stations and the constraints on the e.i.r.p of the radiolocation service and to identify and study, in time for consideration by WRC-03, possible alternative sharing conditions to those indicated in Nos. **5.502** and **5.503**."

A joint decision of Study Groups 4, 7 and 8 (Document CVC-11/9, dated 8 June 2000) established Joint Task Group 4-7-8 to carry out the studies under Resolution **733** on the sharing conditions in footnotes **S5.502** and **S5.503** with a view to review the minimum antenna diameter of GSO FSS Earth station's and the e.i.r.p. constraints of the radiolocation service.

Within this Joint Task Group, studies have been carried out to determine the constraints that would enable fixed-satellite service earth stations with antenna diameters less than 4.5 meters to share with the shipborne radars. The studies have shown that locating fixed-satellite service earth stations a certain distance in-land will greatly minimize the interference into shipborne radars. These studies have also determined a power flux-density level produced by an earth station at a certain location will protect shipborne and land radars. A study determined the levels of off -axis e.i.r.p. density that will protect airborne radars. With respect to sharing between FSS earth stations and space research service systems, the studies have identified maximum on-axis e.i.r.p. density levels that will protect the space research service systems. All of these constraints will enable fixed-satellite service earth stations to share with shipborne, airborne and land-based radars and space research service systems while allowing the FSS to deploy antennas with diameters smaller than 4.5 meters. As such, it is appropriate to modify footnote 5.502 to remove the antenna diameter limitation and specify the constraints on the fixed-satellite service. These studies have led to Option A below.

It is noted that the radiolocation allocation in the band 13.75 - 14.0 GHz is part of a larger allocation that spans from 13.4 - 14.0 GHz. Several input documents into the JTG are based on the scenario where there are six ships operating in the same general area. Each ship is equipped with two radar systems, and each system operates over a 10 MHz bandwidth, resulting in a total occupied bandwidth of 120 MHz. This information has led to Option B below.

Proposals:

OPTION A:

USA/1.24/A1

MOD 5.502

5.502 In the band 13.75-14 GHz, an earth station of a non-geostationary ~~in the~~ fixed-satellite service network shall have a minimum antenna diameter of 4.5 m ~~and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW~~. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW above 2° elevation and 65 dBW below. ~~The protection of assignments to receiving space stations in the fixed-satellite service operating with earth stations that, individually, have an e.i.r.p. of less than 68 dBW shall not impose constraints on the operation of the radiolocation and radionavigation stations operating in accordance with the Radio Regulations. No. 5.43A does not apply. See Resolution 733 (WRC-2000).~~ An administration planning to use FSS earth stations less than 4.5m in a geostationary network in this band shall ensure that the single entry power flux density produced by any earth station operating within its territory does not exceed

- 114.7 dBW/m^2/10 MHz not to be exceeded for more than 0.1% of the time produced at 36 m above sea level at the baseline (low water mark as defined in UN Convention on Law of the Sea 1982).

- 114.7 dBW/m^2/10 MHz not to be exceeded for more than 0.1% of the time produced 3 m above ground at the border.-

These limits do not apply to FSS earth stations brought in service prior to 4 July 2003. The power flux-density produced by an FSS earth station shall be calculated in accordance with Resolution **ZZZ.**

Reason: This modification to the footnote will allow for the operation of FSS earth stations with antenna diameters smaller than 4.5 meters while protecting shipborne and land-mobile radar systems. Resolution ZZZ will provide a methodology for Administrations to calculate the power flux-density levels from a given FSS earth station and will also address additional mitigation techniques that may be necessary for FSS earth stations located close to either the baseline or a border.

USA/1.24/A2

MOD 5.503: In the band 13.75 - 14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space station in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

- the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall comply with Section VII of Article 22 ~~not exceed 71 dBW~~ in the 6 MHz band from 13.772 - 13.778 GHz;
- the e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 - 13.778 GHz.

Reason: This modification provides a satisfactory solution to the sharing situation between the fixed-satellite service and the space research service in the band 13.772 - 13.778 GHz. This will allow for the use of smaller antenna diameter earth stations in the fixed-satellite service without impacting the space research service operations. Since the studies have shown that the on-axis e.i.r.p. density limitations vary for different antenna sizes, it is best to put the new limits in a new section of Article 22. An alternative approach, where the limits are defined as an equation based on antenna diameter, is to add the equation to the footnote.

USA/1.24/A3

ADD Section VII of Article 22

Section VII - EIRP density limitations on earth stations in the fixed-satellite service operating in the band 13.772 - 13.778 GHz

22.40 The level of equivalent isotropic radiated power (e.i.r.p) emitted by an earth station of a geostationary-satellite network in the fixed-satellite service operating in the band 13.772 - 13.778 GHz shall not exceed the following values for the given antenna size:

Antenna diameter	Maximum e.i.r.p density
0.75 m	-11.2 dB(W/Hz)
1.2 m	-7.1 dB(W/Hz)
1.8 m	-3.6 dB(W/Hz)
2.4 m	-1.1 dB(W/Hz)
$\geq$ 4.5 m	4.4 dB(W/Hz)

USA/1.24/A4

ADD 21.13bis

21.13bis The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station of a geostationary-satellite network in the frequency band 13.75 - 14.0 GHz shall not exceed the following values for any off-axis angle φ which is 2° or more off the main-lobe axis of an earth station:

Off-axis angle	*Maximum e.i.r.p. in any 1 MHz band*
$2° \leq \varphi \leq 7°$	43 - 25 log(φ) dBW
$7° < \varphi \leq 9.2°$	22 dBW
$9.2° < \varphi \leq 48°$	46 - 25 log(φ) dBW
$48° < \varphi \leq 70°$	4 dBW
$70° < \varphi \leq 180°$	14 dBW

These e.i.r.p. limits do not apply to FSS earth station antennas brought in service prior to 4 July 2003, nor to earth stations associated with a satellite network in the fixed-satellite service for which complete coordination or notification information has been received before 4 July 2003.

Reason: This modification will allow for the operation of FSS earth stations with antenna diameters smaller than 4.5 meters while protecting airborne radar systems.

USA/1.24/A5

ADD Resolution ZZZ

Resolution ZZZ

Methodology for calculating the power flux-density at Radiolocation stations located at the baseline[1] or at the border of an Administration produced by GSO FSS Earth stations in the 13.75-14 GHz band

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that WARC-92 (Malaga-Torremolinos, 1992) added a primary allocation to the fixed-satellite service (Earth-to-space) in the 13.75 - 14.0 GHz band;

b) that this band is also allocated on a primary basis to the radiolocation service;

c) that, in some countries, the band is also allocated to the fixed service, the mobile service (Nos. 5499 and 5.500) and the radionavigation service (No. 5.501);

d) that Resolution 733 of WRC-2000 invited the ITU-R to conduct studies, as a matter of urgency, on the sharing constraints indicated in Nos. 5.502 and 5.503, with a view to review the constraints in No. 5.502;

e) that No. 5.502 was modified to allow GSO fixed-satellite service systems to operate earth station antennas with no limit on the antenna in the band 13.75 - 14.0 GHz subject only to a power flux density limit at 36m above sea level at the baseline (low water mark as defined in UN Convention on Law of the Sea 1982) of -114.7 dBW/m2/10MHz for 0.1 % of the time or a power flux density limit at 3 m above ground level at the border of another administration of - 114.7 dBW/m^2/10 MHz not to be exceeded for more than 0.1% of the time;

f) that GSO fixed-satellite service earth stations operating in the band 13.75 - 14.0 GHz may need to employ certain mitigation techniques in order to reduce the interference into the radiolocation systems when they are located in close proximity to the baseline or the border of another Administration;

[1] low water mark as defined by UN Convention on Law of the Sea 1982

g) that there may be several mitigation techniques available to the GSO fixed-satellite service earth stations referred to in *considering f)*, including natural and man-made site shielding, minimum elevation angle, etc, that will offer significant signal discrimination,

resolves

1 that administrations use the methodology in Annex 1 to calculate the power flux density level at 36m above sea level at the baseline (low water mark as defined in UN Convention on Law of the Sea 1982) or at 3 m above ground level at the border of another administration from a GSO FSS earth station operating in the 13.75-14 GHz band

invites ITU-R

to study, as a matter of urgency, additional technical and procedural measures (e.g., natural and man-made site shielding) which GSO fixed-satellite service earth stations operating in the frequency band 13.75 - 14.0 GHz, should take to ensure the power flux density limit in considering d) is met.

ANNEX 1

Method for calculating the power flux-density at Radiolocation stations located at the baseline[2] or at the border of an Administration produced by GSO FSS Earth stations in the 13.75-14 GHz band

1 General

1.1 This Annex describes a method of calculating the interference potential from GSO FSS earth station transmitters to Maritime or land-based mobile radiolocation receivers.

1.2 This method is in two parts:

a) the calculation of the likely power flux-density produced at any point 36m above sea level at the baseline or at any point 3 m above ground level at the border of another administration;
b) The calculation of the likely power flux-density produced at any point 36m above sea level at the baseline or at any point 3 m above ground level at the border of another administration taking into account the site shielding and other mitigation techniques

1.3 The interference potential of a GSO FSS earth station transmitter must be considered case by case; the power flux-density produced by each GSO FSS earth station transmitter into a maritime radiolocation receiver at a point 36m above the baseline or into a land-based mobile

[2] low water mark as defined by UN Convention on Law of the Sea 1982

radiolocation receiver at a point 3m above ground level at the border of another administration shall be less than the interference power flux-density limit.

1.4 It is emphasized that, should the calculation described in this Annex indicate that the maximum permissible power flux-density is exceeded, it does not necessarily preclude the introduction of an FSS earth station since the calculations are based on specific assumptions for:

a) the nature of the terrain of the interference path;

b) the off-beam discrimination on the radiolocation receiving installations;

c) the necessary protection ratios for the radiolocation service;

d) the type of maritime radiolocation service that will be deployed in that area;

e) the value of power flux-density to be protected in the radiolocation service;

f) the specific propagation conditions between the GSO FSS earth station and the radiolocation receiver.

2 Limit of power flux-density

General

The interference power flux-density from a GSO FSS earth station transmitter into a radiolocation receiver at 36m above the baseline or at 3m above ground level at the border of another administration shall not exceed the following:

$$X \text{ dBW/m}^2\text{/10MHz for more than } Y \text{ \% of the time} \quad (1)$$

where:

X: the maximum permissible interfering power flux-density (dB(W/m^2)) within the 10 MHz bandwidth of the radiolocation receiver;

Y: the percentage of time the GSO FSS earth station interfering power flux-density, X, would be seen by the radiolocation receiver;

2.2 Single entry Power Flux Density Level

2.2.1 The single entry power flux density level to protect for the Radiolocation receiver is based on an I/N requirement of –6dB which corresponds to an interference level of –133 dBW in a bandwidth of 10 MHz at the receive output flange of a radiolocation antenna.

2.2.2 A signal from a GSO FSS earth station should be considered only if its necessary bandwidth overlaps the 13.75-14 GHz band.

2.2.3 The pfd level at the radiolocation antenna which would correspond to the –133 dBW /10MHz to the receiver can be derived as follows:

Since the gain of the radiolocation toward the horizon is 26 dBi, its effective aperture calculated from equation (4) is:

$$A_e \text{ dBm}^2 = 26 \text{ dBi} + (-44.3 \text{ dBm}^2) = -18.3 \text{ dBm}^2. \quad (2)$$

Thus, at the point in its scan where the radiolocation antenna is pointed at the FSS ES, the received interfering signal power at the output of the antenna is:

$$\text{If I} = -133 \text{ dBW/10MHz}$$

$$I = pfd + Ae = -133 \text{ dBW/10MHz} - (-18.3 \text{ dBm}^2)$$

$$pfd = -114.7 \text{ dBW/m}^2\text{/10MHz}. \quad (3)$$

A pfd of –114.7 dBW/ m^2/10MHz at the face of the antenna would just meet the –6 dB I/N threshold whenever the radiolocation antenna is pointed directly at the FSS ES.

2.3 Probability of Interference

2.3.1 The probability that the radiolocation receiver would receive interference from a GSO FSS earth station would depend upon the radiolocation antenna beamwidth and the rotation/scan angle, and the variation of the propagation loss as a function of time.

2.3.2 The duty factor of an individual FSS earth station should also be taken into account in the calculation of the percentage of time that the power flux-density is received at the radiolocation receiver.

2.3.3 The combined probability of interference into the main beam of the radiolocation antenna and the interference path propagation loss should be equivalent to 0.1 % of the time.

2.4 Radiolocation Antenna Pattern

2.4.1 The azimuthal angular discrimination of the radiolocation antenna is shown in Figure 1 and the parameters for the radiolocation antenna are given in Table 1.

Figure 1. Radar Antenna Gain Pattern as a Function of Azimuth Off-Axis Angle

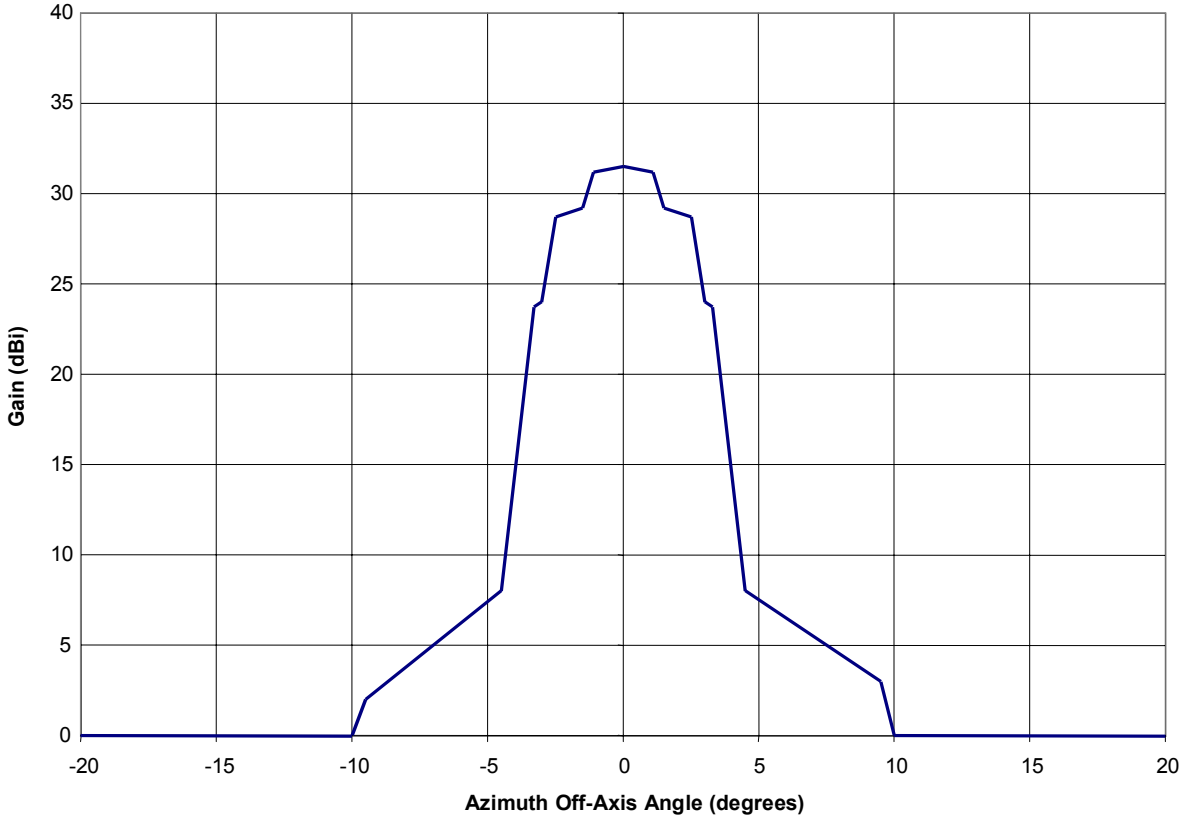

Table 1. Radar Antenna Parameters

Elevation beamwidth (degrees)	Elevation beam centre (degrees)	Maximum Gain (dB)	Azimuth beamwidth (degrees)
10	4.5	31.5	2.2

2.4.2 For this antenna operating at an elevation angle of 4.5 degrees the antenna gain in the direction of the horizon would be approximately 26 dBi.

3 Power flux-density produced by a GSO FSS Earth station (F_p)

The power flux-density F_p (dB(W/m^2-10MHz)) produced at any point on the baseline or the border where a radiolocation station could be located is determined from the following formula:

$$F_p = P_i + G_\phi - A + 44.3 \quad (4)$$

where:

P_i : the input power (dBW/10MHz) into the FSS earth station antenna;

G_ϕ : the gain (dBi) of the GSO FSS earth station in the direction of the radiolocation station, taking into account the elevation and azimuth angle discrimination;

A : the total path loss (dB).

3.1 Evaluation of path loss A for a GSO FSS earth station at a distance greater than 100 km from baseline or the border of another administration

For path lengths greater than 100 km, A is given by:

A = path loss to be calculated by relevant ITU-R Recommendations (Rec ITU-R P.452-10 and Rec. ITU-R P.526)[3] (5)

3.2 Evaluation of path loss A for a GSO FSS earth station at a distance equal to or less than 100 km from the baseline or the border of another administration

For path lengths equal to or less than 100 km, A is calculated using equations (6) and the value obtained is substituted in formula (4) to calculate the power flux-density produced at the point concerned on the edge of the service area:

[3] Another method to calculate the path loss may be developed by the Joint Correspondence Group of Joint Task Group 4-7-8

A = path loss to be calculated by relevant ITU-R Recommendations (Rec ITU-R P.452-10 and Rec. ITU-R P.526)[3] (6)

3.3 Calculation of the percentage of time factors due to the rotation of the radar and the duty factor of the GSO FSS earth station

Although the power flux-density level calculated in the above sections corresponds to the level that would be received by the radiolocation receiver at all times when the GSO FSS earth station is transmitting, this level corresponds to an I/N of -6 dB only when the interference is received by the radiolocation system with its antenna directed at the FSS earth station. Therefore, for times when the azimuth mainbeam of the radiolocation antenna is not directed toward the GSO FSS earth station, the interference received will result in an I/N that is less than -6 dB and the radar will be sufficiently protected. This important factor needs to be included in the determination of the percentage of time that a power flux-density level may be exceeded. In order to determine the percentage of time that the radiolocation receiver would experience an I/N of -6 dB, the rotation of the radar needs to be taken into account. As an example, consider the antenna shown in Section 2.4. This antenna has an azimuth 3 dB beamwidth of 4.4° (2.2° on each side of the mainbeam). If we assume that this antenna rotates 360° in azimuth, the percentage of time the power flux-density level calculated above will result in an I/N of -6 dB is 1.22%. For the rest of the time, the I/N resulting from this power flux-density level will be less than -6 dB. This calculation overestimates the percentage of time that the radar will be affected because the power flux-density at 2.2° off the mainbeam is already 3 dB below the maximum antenna gain.

Additionally, in determining the percentage of time the calculated power flux-density level will be received, the duty factor of the individual GSO FSS earth station needs to be taken into account. Following on the above example, if the duty factor for the GSO FSS earth station is 10%, the resultant percentage of time that the power flux-density level will be received is 1.22% x 10%, or 0.12%.

3.4 Distance beyond which the method need not be applied

The method need not be applied when the distance between the GSO FSS earth station and the baseline or the border of another administration is greater than:

a) 100 km in the case of all overland paths; *or*

b) 125 km in the case of all oversea or mixed paths[4].

[4] The Joint Correspondence Group of Joint Task Group 4-7-8 may develop numbers different than these in the course of its work.

4 Site Shielding and Other Mitigation Techniques

In the case that the calculation of the power flux-density level and percentage of time in Section 3 results in a level that exceeds the interference threshold for the radiolocation system, other mitigation techniques, such as site shielding, may be used at the GSO FSS earth station in order to reduce the power flux-density to a level that meets the threshold. Further study is necessary to determine the additional signal discrimination from both natural and man-made site shielding.

Reason:

This resolution is necessary to define a calculation methodology to be used by Administrations when FSS earth stations are deployed in the frequency band 13.75 - 14.0 GHz.

USA/1.24/A6

SUP Resolution 733

Reason: As the above proposals satisfy the agenda item and the Resolution, Resolution 733 is no longer needed.

OPTION B:

USA/1.24/B1

MOD 5.502 In the band 13.75 - 13.875~~ 14 GHz~~, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. In the band 13.875 - 14 GHz, an earth station of a non-geostationary fixed-satellite service network shall have a minimum antenna diameter of 4.5 m. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services in the band 13.75 - 14 GHz shall not exceed 59 dBW. The protection of assignments to receiving space stations in the fixed-satellite service operating with earth stations that, individually, have an e.i.r.p. of less than 68 dBW shall not impose constraints on the operation of the radiolocation and radionavigation stations operating in accordance with the Radio Regulations. No. 5.43A does not apply.~~ See Resolution 733 (WRC-2000).~~

Reason: This modification will result in the same level of protection for the radiolocation systems in 125 MHz of the spectrum as they receive today. It will also result in the same level of protection for the SRS systems. This allows for the operation of FSS earth terminals smaller than 4.5 meters in a portion of the band.

USA/1.24/B2

ADD 21.13bis

21.13bis The level of equivalent isotropically radiated power (e.i.r.p.) emitted by an earth station of a geostationary-satellite network in the frequency band 13.75 - 13.875 GHz shall not exceed the following values for any off-axis angle φ which is 2° or more off the main-lobe axis of an earth station:

Off-axis angle	*Maximum e.i.r.p. in any 1 MHz band*
$2° \leq \varphi \leq 7°$	43 - 25 log(φ) dBW
$7° < \varphi \leq 9.2°$	22 dBW
$9.2° < \varphi \leq 48°$	46 - 25 log(φ) dBW
$48° < \varphi \leq 70°$	4 dBW
$70° < \varphi \leq 180°$	14 dBW

These e.i.r.p. limits do not apply to FSS earth station antennas brought in service prior to 4 July 2003, nor to earth stations associated with a satellite network in the fixed-satellite service for which complete coordination or notification information has been received before 4 July 2003.

Reason: This modification will allow for the operation of FSS earth stations with antenna diameters smaller than 4.5 meters while protecting airborne radar systems in the band 13.75 - 13.875 GHz.

USA/1.24/B3

SUP Resolution 733

Reason: As the above proposal satisfies the agenda item and the Resolution, Resolution 733 is no longer needed.

IV. Informal Working Group 6: Public Protection and Other Issues

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/128(22.07.02)

Agenda Item 1.3: to consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution 645 (WRC-2000);

Background – WRC-2000 considered the growing telecommunications needs of public protection and disaster relief agencies for future advanced solutions employing high data rates, video and multimedia technologies, and the need for interoperability among service providers dealing with emergency situations and disaster relief in developing Resolution 645.[5] In recognition of the importance of such growing national needs to the maintenance of law and order and the protection of life and property, WRC-2000 resolved to consider the identification of globally/regionally harmonized bands for advanced solutions for Public Protection and Disaster Relief (PPDR) at WRC-2003 (WRC-03) and to make regulatory provisions, as necessary.

ITU-R Working Party 8A (WP-8A) was designated as having responsibility to undertake appropriate studies related to public protection and disaster relief and report the results of these studies to WRC-03. A questionnaire was developed and addressed to Members and Sector Members of ITU-R (Circular Letter 8/LCCE/83 dated Nov. 20, 2000) in order to assess the current activities, future plans and intentions with regard to public protection and disaster relief communications. A Work Plan for studies on public protection and disaster relief was also approved (Doc. 8A/TEMP/012 Rev 1). The questionnaire viewed the development of public protection and disaster relief communications in the context of narrowband, wideband and broadband technologies (PPDR). At an interim meeting of WP-8A Working Group 3 (WP-8A3), held from April 2-6, 2001 in Goa, India, the responses to the questionnaire from 37 Administrations, four Sector Members and two international groups were analyzed indicating that most national PPDR communications at present are dependent upon the use of narrowband analog technologies with a trend toward the introduction of narrowband digital technologies. The individual responses of Administrations were focused almost exclusively on assessment of national PPDR requirements and identified existing domestic allocations for PPDR uses, noting that a degree of regional harmonization already exists for narrowband PPDR.

At the October 2001 WP-8A meeting, a number of Working Documents were prepared for consideration at the February 2002 interim meeting of WP-8A3. They included a Working Document on user requirements and applications for PPDR communications

[5] Resolution 645 recommends that WRC 2003 consider the identification of globally/regionally harmonized bands for public protection and disaster relief.

(Doc.8A/TEMP/64), while another was a working document towards a PDNR titled "Global Cross-Border Circulation of Radiocommunication Equipment" (Doc.8A/TEMP/51). The methodology for calculating spectrum requirements for PPDR was further analyzed. As a result, a third working document (Doc.8A/TEMP/50) was created which describes the methodology and identifies the steps required in order to complete the studies related to the calculation of PPDR spectrum requirements. A fourth working document was prepared that lists potential PPDR candidate bands for consideration by WRC-03, including initial summaries of the particular advantages and disadvantages of each band (Doc. 8A/TEMP/62). Finally, a working document was prepared proposing CPM text for Chapter 2 of the draft CPM Report (Doc.8A/TEMP/33). The deadline for completion of the Draft CPM Report was May 31, 2002.

Despite these various working documents, the underlying requirement for global or regional PPDR spectrum harmonization has not yet been adequately addressed within WP 8A. These studies do not address the issue of domestic requirements for additional spectrum for public protection or disaster relief. In fact, there has been little support from internationally oriented public safety or disaster relief organizations for such regional or global harmonized spectrum, and there has been significant questioning of the need for, and concerns raised regarding possible regulatory restrictions that may result from, designation of spectrum for PPDR. These concerns, raised by the United Nations and the International Red Cross, are being addressed in WP-8A. Concerns raised by the US Federal Emergency Management Agency (FEMA) and the U.S. Department of Justice are also still being addressed.

If, however, after thorough examination, it is found that globally or regionally harmonized spectrum is desirable, identification of this spectrum should be in the form of either a WRC-03 Resolution or Recommendation, rather than in the Radio Regulations. As a result, the United States proposes the following:

USA/1.3/1

NOC

ARTICLE 5

Frequency allocations

Reasons: At this point in time, there has been little support from internationally oriented public safety or disaster relief organizations for regional or global harmonized spectrum. Moreover, there has been significant questioning of the need for, and concerns raised regarding possible regulatory restrictions that may result from, international designation of spectrum for Public Protection or Disaster Relief in the Radio Regulations. Therefore, in order to avoid any potential constraints on the ability of individual administrations to use spectrum in which they currently operate, it is appropriate not to make changes to Article 5 of the Radio Regulations.

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/129(22.07.02)

WRC-03 Agenda Item 1.36: to examine the adequacy of the frequency allocations for HF broadcasting from about 4 MHz to 10 MHz, taking into account the seasonal planning procedures adopted by WRC-97;

BACKGROUND. Since prior to HFBC WARC-84 it was recognized that there was inadequate spectrum worldwide for the Broadcasting Service, and especially in the band 4-10 MHz. Broadcasting Service proposals submitted to WARC-92 identified the need for 700 kHz of additional spectrum below 10 MHz. However, WARC-92 only allocated 200 kHz, specifically,

5900-5950 kHz	= 50 kHz
7300-7350 kHz	= 50 kHz
9400-9500 kHz	= 100 kHz
Total	= 200 kHz

In addition, RR 5.134 limits these frequencies to single sideband (SSB) emissions or any other spectrum efficient methods recommended by ITU-R. RR 5.136 allocates these bands to other services until 1 April 2007. Resolution 537(**WRC-97**) called for a survey of HF broadcasting transmitters and receivers with emphasis on the worldwide distribution of SSB transmitters and receivers. ITU-R completed this survey in 1999 and submitted its report at WRC-2000, concluding that the limited availability of SSB transmitters and receivers did not justify the mandated conversion from DSB to SSB.

ITU-R Working Party 6E, in drafting the CPM text for Agenda Item 1.36, provided further evidence that there is a serious shortage of spectrum available to the HF Broadcasters. The CPM text shows the need for some 800 kHz of additional spectrum to eliminate the current situation of co-channel and adjacent channel collisions now taking place worldwide in the 6, 7, and 9 MHz broadcasting bands. This is based on actual data for the year 2000, collected at the regional high frequency coordinating conferences (introduced by WRC-97 as part of Article S12).

Additionally, there is the data from the FCC-licensed broadcasters. These HF Broadcasters are currently using, on a non-interference basis, some 80 frequency hours in the WARC-92 bands and another 350-plus hours of "Out of Band" use elsewhere in the spectrum not allocated to the broadcasting service. Figures on a worldwide basis may be deduced from the seasonal schedules required by Article S12, and administered by the High Frequency Coordinating Conference (HFCC).

The results of the previously referred to studies on HF Broadcasting spectrum requirements confirm that the following proposed additional spectrum below 10 MHz would reduce considerably the present spectrum deficiencies for this service:

4500-4650 kHz	=150 kHz
5060-5250 kHz	= 90 kHz

5840-5900 kHz = 60 kHz (*)
7350-7650 kHz = 300 kHz (*)(**)
9290-9400 kHz =110 kHz (*)
9900-9940 kHz = 40 kHz (*)
850 kHz

* Band adjacent to the HF broadcasting bands governed by Article S12
** Band location may need to be revised in light of actions decided with respect to WRC-03 agenda item 1.23

All of these bands are currently allocated to the fixed and/or mobile services.

Proposals

USA/1.36/1

4438-4650 kHz

	Allocation to services		
	Region 1	**Region 2**	**Region 3**
MOD	**4438-4500-~~4650~~** FIXED MOBILE except aeronautical mobile (R)		**4 438-4500 ~~4650~~** FIXED MOBILE except aeronautical mobile
MOD	**4 500-4 650** BROADCASTING 5.uuu		

ADD **5.uuu** The band 4500-4650 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, as well as to the following services: in Regions 1 and 2 to the mobile except aeronautical mobile (R) service on a primary basis and in Region 3 to the mobile except aeronautical mobile service on a primary basis, subject to application of the procedure referred to in Resolution XXX. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

USA/1.36/2

5 060-5250 kHz

	Allocation to services		
	Region 1	**Region 2**	**Region 3**
MOD	**5 060-5 250**	~~FIXED~~ ~~Mobile except aeronautical mobile~~ ~~5.133~~ BROADCASTING 5.vvv	

ADD **5.vvv** The band 5060-5250 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, and to the mobile except aeronautical mobile service on a secondary basis, subject to application of the procedure referred to in Resolution XXX. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

USA/1.36/3

5730-5900 kHz

	Allocation to services		
	Region 1	**Region 2**	**Region 3**
MOD	**5 730-~~5900~~ 5840** FIXED LAND MOBILE	**5 730-~~5900~~ 5840** FIXED MOBILE except aeronautical mobile (R)	**5 730-~~5900~~ 5840** FIXED Mobile except aeronautical mobile (R)
MOD	**5 840-5900**	BROADCASTING 5.www	

ADD **5.www** The band 5840-5900 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, as well as to the following services: in Region 1 to the land mobile service on a primary basis, in Region 2 to the mobile except aeronautical mobile (R) service on a primary basis, and in Region 3 to the mobile except aeronautical mobile (R) service on a secondary basis, subject to application of the procedure referred to in Resolution XXX. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

USA/1.36/4

7 350-8100 kHz

	Allocation to services		
	Region 1	**Region 2**	**Region 3**
MOD	**7 350-~~8100~~ 7650**	~~FIXED~~ ~~Land mobile~~ ~~5.144~~ BROADCASTING 5.xxx	
	7650-8100	FIXED Land mobile 5.144	

ADD **5.xxx** The band 7350-7650 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, as well as to the land mobile service on a secondary basis, subject to application of the procedure referred to in Resolution XXX. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

USA/1.36/5

9040-9400 kHz

	Allocation to services		
	Region 1	**Region 2**	**Region 3**
MOD	**9 040-~~9400~~ 9290**	FIXED	
MOD	**9290-9400**	BROADCASTING 5.yyy	

ADD **5.yyy** The band 9290-9400 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, subject to application of the procedure referred to in Resolution XXX. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition

that administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

USA/1.36/6

9900-9995 kHz

	Allocation to services		
	Region 1	**Region 2**	**Region 3**
MOD	**9 900-~~9 995~~ 9940**	BROADCASTING 5.zzz	
MOD	**9940-9995**	FIXED	

ADD **5.zzz** The band 9900-9940 kHz is allocated, until 1 April 2007, to the fixed service on a primary basis, subject to application of the procedure referred to in Resolution XXX. After 1 April 2007, frequencies in this band may be used by stations in the above-mentioned services, communicating only within the boundary of the country in which they are located, on the condition that administrations are urged to use the minimum power required and to take account of the seasonal use of frequencies by the broadcasting service published in accordance with the Radio Regulations.

REASON

To provide additional spectrum to the broadcasting service and to provide a transition period for the previously allocated services.

USA/1.36/7

ADD Resolution XXX

RESOLUTION XXX

Implementation of changes in frequency allocations between 4 500 kHz and 9 940 kHz

The World Radiocommunication Conference (Geneva, 2003),

considering

a) that parts of the frequency bands between 4 500 kHz and 9 940 kHz which were previously allocated on an exclusive or shared basis to the fixed and mobile services have been reallocated to the broadcasting service;

b) that some existing fixed and mobile assignments may need to be removed progressively from those reallocated bands to make way for the broadcasting service;

c) that the assignments to be removed, termed "displaced assignments", must be reaccommodated in other appropriate frequency bands;

d) that developing countries may require special assistance from the Radio-communication Bureau, in replacing their displaced assignments with appropriate protection;

e) that procedures already exist in Article 11 that may be used to this effect,

recognizing

the difficulties that administrations and the Bureau might encounter during the period of transition from the previous allocations to those made by WRC 2003,

resolves

1 that the duration of the transition period shall be from x July 2003 to 1 April 2007;

2 that administrations should no longer notify any frequency assignments to stations of the fixed and mobile services in the reallocated bands. Assignments notified in these bands after x July 2003 shall bear a symbol to indicate that the finding will be examined by the Bureau as of 1 April 2007 in accordance with the provisions of No. 11.31;

3 that the Bureau shall undertake a continuing action to review the Master International Frequency Register with the help of administrations. In this respect, the Bureau shall periodically consult the administrations concerning the frequency assignments to links for which another satisfactory means of telecommunication exists, with a view to either downgrading assignments of class of operation A or deleting such assignments;

4 that administrations shall, for assignments of class of operation A in the reallocated bands, either notify the replacement frequencies to the Bureau or request the Bureau's assistance in selecting the replacement frequencies in application of Articles 7 and 13;

5 that the Bureau shall develop in due time a draft procedure to be used for the replacement of remaining frequency assignments and shall consult administrations in accordance with Article 14;

6 that the Bureau should modify the draft procedures taking into account, to the extent practicable, comments received from administrations, and propose replacement assignments at the latest three years before 1 April 2007. In so doing, the Bureau shall request administrations to take

appropriate action to bring their assignments in conformity with the Table of Frequency Allocations by the due date;

7 that a replacement frequency assignment whose basic characteristics, with the exception of the assigned frequency, have not been modified in the above process, shall keep its original date. However, if these basic characteristics of a replacement frequency assignment are different from those of the displaced assignment, the replacement assignment shall be treated in accordance with the relevant provisions of Section II of Article 11,

invites administrations

when seeking reaccommodation of the displaced assignments for their fixed and mobile services in the bands between 4 500 kHz and 9 940 kHz which have been reallocated to the broadcasting service, to make every effort to find replacement assignments in the bands allocated to the fixed and mobile services concerned.

REASON

To facilitate an orderly transition from fixed and mobile allocations to a broadcasting allocation.

V. Informal Working Group 7: Regulatory Issues and Future Agendas

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/130(22.07.02)

WRC-03 Agenda Item 1.30d: to consider possible changes to the procedures for the advance publication, coordination and notification of satellite networks in response to Resolution **86** (Minneapolis, 1998)

Modification to Appendix 7 clarify that the procedure is applicable to case where the two services are allocated on an equal basis including secondary services.

BACKGROUND: Resolution **86** (Minneapolis, 1998) resolves to request WRC-2000 and subsequent WRCs to continually review and update the advance publication, coordination and notification procedures, including the associated technical characteristics, and the related Appendices of the Radio Regulations, so as to ensure that they reflect the latest technologies, as well as to achieve additional simplification and cost savings for the Radiocommunication Bureau and administrations.

A modification is needed in Article 9 and Appendix 7 to reflect the intent of the Appendix 7 procedure to apply to any case where the space service earth station operates co-frequency with another service where the allocation status is equal for the two services. See Table 10 in Appendix 7.

MOD

9.17A *m)* for any specific earth station in respect of other earth stations, or typical mobile earth stations in respect of specific earth stations, operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of another earth station, with the exception of the coordination under No. **9.19**;

Reason: To include the coordination mechanism to allow coordination between typical mobile earth stations in respect of specific earth stations.

MOD

TABLE 5-1 (*continued*)

Reference of Article 9	**Case**	**Frequency bands (and Region) of the service for which coordination is sought**	**Threshold/condition**	**Calculation method**	**Remarks**
No. **9.17A** GSO, non-GSO/ GSO, non-GSO	A specific earth station in respect of other earth stations, or typical mobile earth stations in respect of specific earth stations, operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station, with the exception of coordination under **9.19**	Any frequency band allocated to a space service	The coordination area of the earth station covers the territory of another administration or the earth station is located within the coordination area of an earth station	Appendix **7**	

Reason: Consequential to modification of No. 9.17A in Article 9.

APPENDIX 7 (WRC-2000)

Methods for the determination of the coordination area around an earth station in frequency bands between 100 MHz and 105 GHz

MOD

1.4.4 Earth stations operating in bidirectionally allocated frequency bands

For earth stations operating in some frequency bands there may be ~~co-primary~~ allocations to space services operating with equal rights in both the Earth-to-space and space-to-Earth directions. In this case, where two earth stations are operating in opposite directions of transmission it is only necessary to establish the coordination area for the transmitting earth station, as receiving earth stations will automatically be taken into consideration. Hence, a receiving earth station operating in a bidirectionally allocated frequency band will only be involved in coordination with a transmitting earth station if it is located within the transmitting earth station's coordination area.

For a transmitting earth station operating with either geostationary or non-geostationary satellites in a bidirectionally allocated frequency band, the coordination area is determined using the procedures described in § 3.

Reason: Brings the text in line with existing No. 9.17A and Appendix 5 provisions.

MOD

APPENDIX 7

TABLE 10

Predetermined coordination distances

Frequency sharing situation		**Coordination distance(in sharing situations involving services allocated with equal rights) (km)**
Type of earth station	**Type of terrestrial <u>or</u> <u>earth</u> station**	
Ground-based in the bands below 1 GHz to which No. **9.11A** applies. Ground-based mobile in the bands within the range 1-3 GHz to which No. **9.11A** applies	Mobile (aircraft)	500
Aircraft (mobile) (all bands)	Ground-based	500
Aircraft (mobile) (all bands)	Mobile (aircraft)	1 000
Ground-based in the bands: 400.15-401 MHz 1 675-1 700 MHz	Station in the meteorological aids service (radiosonde)	580
Aircraft (mobile) in the bands: 400.15-401 MHz 1 675-1 700 MHz	Station in the meteorological aids service (radiosonde)	1 080
Ground-based in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	100
Airborne earth station in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	400

TABLE 10 *(end)*

Frequency sharing situation		**Coordination distance(in sharing situations involving services allocated with equal rights) (km)**
Type of earth station	**Type of terrestrial station**	
Receiving earth stations in the meteorological-satellite service	Station in the meteorological aids service	The coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius (see Note 1)
Non-GSO MSS feeder-link earth stations (all bands)	Mobile (aircraft)	500

NOTE 1 - The coordination distance, *d* (km), for fixed earth stations in the meteorological-satellite service vis-à-vis stations in the meteorological aids service assumes a radiosonde altitude of 20 km and is determined as a function of the physical horizon elevation angle ε_h (degrees) for each azimuth, as follows:

$$d = 100 \quad \text{for} \quad \varepsilon_h \geq 11$$

$$d = 582\left(\sqrt{1+(0.254\,\varepsilon_h)^2} - 0.254\,\varepsilon_h\right) \quad \text{for} \quad 0 < \varepsilon_h < 11,$$

$$d = 582 \quad \text{for} \quad \varepsilon_h \leq 0$$

The minimum and maximum coordination distances are 100 km and 582 km, and correspond to physical horizon angles greater than 11° and less than 0°.

Reason: Allows predetermined distances to be used in the case of typical mobile earth stations in respect of specific earth stations operating in opposite directions of transmission.

VI. Draft Proposals Approved by the National Telecommunications and Information Administration (NTIA)

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/123(22.07.02)

WRC-03 Agenda Item 1.3: to consider identification of globally/regionally harmonized bands, to the extent practicable, for the implementation of future advanced solutions to meet the needs of public protection agencies, including those dealing with emergency situations and disaster relief, and to make regulatory provisions, as necessary, taking into account Resolution **645 (WRC 2000)**;

Background Information: WRC-2000 considered the benefits of globally/regionally harmonized frequency bands for future advanced solutions for public protection and disaster relief and an increasing need for interoperability and inter-working between security and emergency networks, both nationally and for cross-border operations, in emergency situations and disaster relief. The guidance regarding ITU-R studies under agenda item 1.3 is provided in Resolution **645 (WRC-2000)**. This resolution includes the study of possible spectrum for future advanced solutions for public protection and disaster relief. It also includes the possible development of a resolution identifying the technical and operational basis for global cross-border circulation of radiocommunication equipment in emergency and disaster relief situations.

Based on the studies conducted by the ITU-R, the United States believes that any spectrum recognized for future advanced solutions for public protection and disaster relief should be developed in an ITU-R Recommendation and linked to the Radio Regulations through a WRC Recommendation. This approach provides recognition of spectrum used for public protection and disaster relief, acknowledges the need for national prerogatives, and allows flexible updates without maintaining a WRC agenda item specifically for this issue. The United States believes it is important to preserve the prerogatives of Administrations to implement spectrum for future advance solutions for public protection and disaster relief applications. The attached proposed WRC Recommendation allows for recognition of spectrum for future advanced solutions for public protection and disaster relief without conveying any status or priority under the radio regulations, as well as, provides uniform guidance to Administrations, users and manufacturers. This recognition has several advantages such as facilitating economies of scale in the production of radiocommunication equipment for public protection and disaster relief, consolidation of duplicated infrastructure, improved spectrum efficiency, potential for interoperability nationally, regionally as well as internationally, and improved operational effectiveness. A WRC Recommendation would help to facilitate cross-border public protection operations and effective international response to emergency and disaster relief situations when required and would provide the potential for relief organizations around the world to communicate and interact more quickly and efficiently, thereby speeding disaster relief efforts without constraining their ability to use spectrum in which they currently operate. At the same time, recognition of spectrum for future advanced solutions should not preclude the use of any spectrum in bringing disaster relief.

Proposal:

USA/ /1 **NOC**

Article 5

Frequency Allocations

Reasons: The United States does not support identification of spectrum for public protection and disaster relief in the Table of Frequency Allocations (Article 5 of the Radio Regulations).

USA/ /2 ADD

RECOMMENDATION PUBLIC PROTECTION AND DISASTER RELIEF (PPDR) (WRC-03)

Public protection and disaster relief

The World Radiocommunication Conference (Geneva, 2003),

considering

a) the growing telecommunication needs of public agencies and organizations dealing with law and order, disaster relief, emergency response and including the protection of life and property;

b) that future advanced solutions used by such public protection and disaster relief agencies and organizations will require high data rates;

c) that current public protection and disaster relief applications are mostly narrow-band, including voice and low data-rate applications, typically in channel bandwidths of 25 kHz or less; that in even in times of disasters, when most terrestrial-based networks are destroyed, amateurs,

d) that in even in times of disasters, when most terrestrial-based networks are destroyed, amateurs, satellite and other non-terrestrial networks can still provide communications services to assist in public protection and disaster relief efforts;

e) that although there will continue to be narrow-band requirements, many future applications will be wideband (indicative data rates in range of 384-500 kb/s) and broadband (indicative data rates in range of 1-100 Mbit/s) with channel bandwidths dependant on use of spectrally efficient technologies;

f) that technology exists today to enable dissimilar radios to be interoperable across different spectrum with different waveforms;

g) that commercial systems can serve as a complement to dedicated systems in support of public protection and disaster relief applications and that such complementary use would be in response to market demands;

h) that there is potential for new technologies such as IMT-2000 and systems beyond and Intelligent Transportation Systems (ITS) that will support or supplement advanced public protection and disaster relief applications;

i) that Resolution **98 (PP-98)** urges Member States to facilitate use of telecommunications for the safety and security of humanitarian personnel,

recognizing

a) the importance of interoperability in the provision of administrations recognizing and making available spectrum for public protection and disaster relief with the benefits of:

i) increased potential for interoperability;

ii) a broader manufacturing base and increased volume of equipment resulting in economies of scale and expanded availability of equipment;

iii) improved spectrum management and planning;

iv) enhanced cross-border and international coordination;

v) improved cross-border circulation of equipment;

vi) efficient use of radio frequency spectrum

b) that spectrum planning for public protection and disaster relief is done at the national level, should taken into account the need for interoperability and recognized spectrum of neighboring administrations;

c) the benefits of cooperation between countries for the provision of effective humanitarian assistance during disasters;

d) the needs of countries, particularly for developing countries, for low-cost communication equipment for public protection and disaster relief agencies and organizations;

e) that the trend is to increase the use of Internet Protocol (IP) based technologies;

f) that advanced technologies such as software defined radios, cross banding, advanced compression waveforms and networking may help lessen the need for harmonizing spectrum to satisfy public protection and disaster relief requirements

noting

a) applications requiring large coverage areas and providing good signal availability would generally be accommodated in lower spectrum;

b) that many administrations use spectrum below 1 GHz primarily for narrow-band public protection and disaster relief applications;

c) applications requiring wider bandwidths would generally be accommodated in progressively higher spectrum;

d) that in most administrations, public protection and disaster relief applications are provided at multiple administrative levels, starting with national down to local levels, and cooperation between the levels is a national matter to which recognized spectrum and interoperable operations could assist;

e) the existing investment in systems supporting public protection and disaster relief that many administrations have made;

f) that flexibility must be afforded to disaster relief agencies and organizations to use current and future radiocommunication in an independent manner, so as to facilitate their humanitarian operations.

recommends

1. that administrations encourage public protection and disaster relief agencies and organizations to utilize both existing and new technologies and solutions, to the extent practicable, to satisfy their national public protection and disaster interoperability requirements and to further the national goals of public protection and disaster relief agencies and organizations;

2 that administrations encourage agencies and organizations to use advanced wireless solutions,

such as IMT-2000 and ITS, for providing complementary support for the communication needs of public protection and disaster relief agencies and organizations,

further recommends

1. that administrations continue to use spectrum below 1 GHz for narrow-band PPDR applications;

2. that administrations encourage public protection and disaster relief agencies and organizations to utilize relevant ITU-R Recommendations in planning spectrum use and implementing technology and systems supporting public protection and disaster relief;

3. that recognition of spectrum for public protection and disaster relief should not preclude the use of any other spectrum to bring aid in times of disaster and humanitarian assistance.

Reasons: A WRC Recommendation, without any specific identification in Article **5** of the Radio Regulations avoids misinterpretation of the regulatory status of systems supporting public protection and disaster relief applications and disassociates any additional recognition of spectrum for public protection and disaster relief from the Table of Frequency Allocations. Different Regional proposals intended to cover spectrum options can be noted in the text of the Recommendation.

USA/ /3 SUP

RESOLUTION 645 (WRC-2000)

Reasons: It is possible to conclude this agenda item at WRC-03 on the basis that the necessary regulatory requirements have been met. Resolution **645 (WRC-2000)** should be suppressed.

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/124(22.07.02)

WRC-03 Agenda Item 1.12a: to consider allocations and regulatory issues related to the space science services in accordance with Resolution **723 (Rev. WRC-2000)**;

Background Information: ITU-R Recommendation **SA.363-5** recommends that frequencies below 1 GHz are technically suitable for telecommand of satellites in the space science services operating below an altitude of 2000 km. A deficiency in telecommand (uplink) frequency allocations has been previously identified, compared to the available telemetry (downlink) allocations in the 100 MHz to 1 GHz range. The deficiency was first noted in Resolution **712 (WARC-92**), repeated in Resolution **712 (Rev. WRC-95)**, and again in Resolution **723 (WRC-97)**.

This item was originally placed on the WRC-97 agenda. WRC-97 determined that insufficient study had been completed to take action on this agenda item.

Since WRC-2000, additional studies have been undertaken in the ITU-R. The study results show that show that separation distances for aeronautical mobile stations must be over 400 km and for MSS approximately 100 km. These required coordination distances make use of RR **9.17/17a** and Appendix **7** impractical and will result in large geographical regions where existing Aeronautical Mobile, MS, FS, and MSS services are unusable.

Proposal:

USA/ /1 **NOC**

Allocation to services		
Region 1	**Region 2**	**Region 3**
	220-225	
223-230 BROADCASTING Fixed Mobile 5.243 5.246 5.247	AMATEUR FIXED MOBILE Radiolocation 5.241	**223-230** FIXED MOBILE BROADCASTING AERONAUTICAL RADIONAVIGATION Radiolocation 5.250
	225-235 FIXED MOBILE	
230-235 FIXED MOBILE 5.247 5.251 5.252		**230-235** FIXED MOBILE AERONAUTICAL RADIONAVIGATION 5.250

235-267	FIXED MOBILE 5.111 5.199 5.252 5.254 5.256
267-272	FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257
272-273	SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254
273-312	FIXED MOBILE 5.254
312-315	FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255
315-322	FIXED MOBILE 5.254
322-328.6	FIXED MOBILE RADIO ASTRONOMY 5.149
328.6-335.4	AERONAUTICAL RADIONAVIGATION 5.258 5.259
335.4-387	FIXED MOBILE 5.254
387-390	FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.254 5.255
390-399.9	FIXED MOBILE 5.254
399.9-400.05	MOBILE-SATELLITE (Earth-to-space) 5.209 5.224A RADIONAVIGATION-SATELLITE 5.222 5.224B 5.260 5.220

Reasons: ITU-R studies have shown that sharing between telecommand and existing services in the 225 – 400 MHz band results in impractical coordination requirements with existing services.

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/122(22.07.02)

WRC-03 Agenda Item 1.30d: to consider possible changes to the procedures for the advance publication, coordination and notification of satellite networks in response to Resolution **86** (Minneapolis, 1998)

Modification to Appendix 7 clarify that the procedure is applicable to case where the two services are allocated on an equal basis including secondary services.

BACKGROUND: Resolution **86** (Minneapolis, 1998) resolves to request WRC-2000 and subsequent WRCs to continually review and update the advance publication, coordination and notification procedures, including the associated technical characteristics, and the related Appendices of the Radio Regulations, so as to ensure that they reflect the latest technologies, as well as to achieve additional simplification and cost savings for the Radiocommunication Bureau and administrations.

A modification is needed in Article 9 and Appendix 7 to reflect the intent of the Appendix 7 procedure to apply to any case where the space service earth station operates co-frequency with another service where the allocation status is equal for the two services. See Table 10 in Appendix 7. This clarification relates to the situation that will exist when allocation change being made under Agenda Item 1.11 becomes effective.

MOD

9.17A *m)* for any specific earth station or typical mobile earth station, in respect of other earth stations operating in the opposite direction of transmission, in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission and where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of another earth station, with the exception of the coordination under No. **9.19**;

MOD

TABLE 5-1 (*continued*)

Reference of Article 9	**Case**	**Frequency bands (and Region) of the service for which coordination is sought**	**Threshold/condition**	**Calculation method**	**Remarks**
No. **9.17A** GSO, non-GSO/	A specific earth station or typical mobile earth station in	Any frequency band allocated to a space	The coordination area of the earth station covers the territory of another administration	Appendix **7**	

GSO, non-GSO	respect of other earth stations operating in the opposite direction of transmission in frequency bands allocated with equal rights to space radiocommunication services in both directions of transmission, where the coordination area of the earth station includes the territory of another country or the earth station is located within the coordination area of a coordinated earth station, with the exception of coordination under **9.19**	service	or the earth station is located within the coordination area of an earth station		

APPENDIX 7 (WRC-2000)

Methods for the determination of the coordination area around an earth station in frequency bands between 100 MHz and 105 GHz

MOD

1.4.4 Earth stations operating in bidirectionally allocated frequency bands

For earth stations operating in some frequency bands there may be co- equal ~~primary~~ allocations to space services operating in both the Earth-to-space and space-to-Earth directions. In this case, where two earth stations are operating in opposite directions of transmission it is only necessary to establish the coordination area for the transmitting earth station, as receiving earth stations will automatically be taken into consideration. Hence, a receiving earth station operating in a bidirectionally allocated frequency band will only be involved in coordination with a transmitting earth station if it is located within the transmitting earth station's coordination area.

For a transmitting earth station operating with either geostationary or non-geostationary satellites in a bidirectionally allocated frequency band, the coordination area is determined using the procedures described in § 3.

MOD

APPENDIX 7

TABLE 10

Predetermined coordination distances

Frequency sharing situation		**Coordination distance(in sharing situations involving services allocated with equal rights) (km)**
Type of earth station	**Type of terrestrial <u>or earth</u> station**	
Ground-based in the bands below 1 GHz to which No. **9.11A** applies. Ground-based mobile in the bands within the range 1-3 GHz to which No. **9.11A** applies	Mobile (aircraft)	500
Aircraft (mobile) (all bands)	Ground-based	500
Aircraft (mobile) (all bands)	Mobile (aircraft)	1 000
Ground-based in the bands: 400.15-401 MHz 1 675-1 700 MHz	Station in the meteorological aids service (radiosonde)	580
Aircraft (mobile) in the bands: 400.15-401 MHz 1 675-1 700 MHz	Station in the meteorological aids service (radiosonde)	1 080
Ground-based in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	100
Airborne earth station in the radiodetermination-satellite service (RDSS) in the bands: 1 610-1 626.5 MHz 2 483.5-2 500 MHz 2 500-2 516.5 MHz	Ground-based	400

TABLE 10 *(end)*

Frequency sharing situation		**Coordination distance(in sharing situations involving services allocated with equal rights) (km)**
Type of earth station	**Type of terrestrial station**	
Receiving earth stations in the meteorological-satellite service	Station in the meteorological aids service	The coordination distance is considered to be the visibility distance as a function of the earth station horizon elevation angle for a radiosonde at an altitude of 20 km above mean sea level, assuming 4/3 Earth radius (see Note 1)
Non-GSO MSS feeder-link earth stations (all bands)	Mobile (aircraft)	500

NOTE 1 - The coordination distance, d (km), for fixed earth stations in the meteorological-satellite service vis-à-vis stations in the meteorological aids service assumes a radiosonde altitude of 20 km and is determined as a function of the physical horizon elevation angle ε_h (degrees) for each azimuth, as follows:

$d = 100$ for $\varepsilon_h \geq 11$

$d = 582\left(\sqrt{1+(0.254\,\varepsilon_h)}^{2} - 0.254\,\varepsilon_h\right)$ for $0 < \varepsilon_h < 11$,

$d = 582$ for $\varepsilon_h \leq 0$

The minimum and maximum coordination distances are 100 km and 582 km, and correspond to physical horizon angles greater than 11° and less than 0°.

DRAFT PROPOSAL FOR THE WORK OF THE CONFERENCE

Doc. WAC/125(22.07.02)

WRC-03 Agenda Item 7.2: to recommend to the Council items for inclusion in the agenda for the next WRC, and to give its views on the preliminary agenda for the subsequent conference and on possible agenda items for future conferences, taking into account Resolution 801 (WRC-2000);

Background Information: The Table of Frequency Allocations currently extends to 275 GHz. Footnote **5.565,** which was extensively modified by WRC-2000 to accommodate science requirements, states:

> **5.565** The frequency band 275-1 000 GHz may be used by administrations for experimentation with, and development of, various active and passive services. In this band a need has been identified for the following spectral line measurements for passive services:
>
> - radio astronomy service: 275-323 GHz, 327-371 GHz, 388-424 GHz, 426-442 GHz, 453-510 GHz, 623-711 GHz, 795-909 GHz and 926-945 GHz;
>
> - Earth exploration-satellite service (passive) and space research service (passive): 275-277 GHz, 294-306 GHz, 316-334 GHz, 342-349 GHz, 363-365 GHz, 371-389 GHz, 416-434 GHz, 442-444 GHz, 496-506 GHz, 546-568 GHz, 624-629 GHz, 634-654 GHz, 659-661 GHz, 684-692 GHz, 730-732 GHz, 851-853 GHz and 951-956 GHz.
>
> Future research in this largely unexplored spectral region may yield additional spectral lines and continuum bands of interest to the passive services. Administrations are urged to take all practicable steps to protect these passive services from harmful interference until the date when the allocation Table is established in the above-mentioned frequency band.

The science services have made extensive use of the spectrum above 275 GHz for several decades now, mostly through passive applications. A number of radio astronomy observatories operate in this area of the spectrum. Several major new instruments are planned, or are under construction and expect to begin operating in this range in the next few years. Foremost among these is ALMA, an international collaboration between the United States and a consortium of European countries, to build and operate a millimeter wavelength telescope that will be comprised of 64 antennas located in the Chajnantor region of the Chilean Andes.

Likewise, there are already spaceborne passive sensors utilizing frequency bands in the above 275 GHz region of the spectrum, and many more are planned for other bands. Among these is the Microwave Limb Sounder (MLS) planned for launch on the Aura satellite in July 2003. The MLS, which is an enhanced version of the payload currently operating on the Upper Atmospheric Research Satellite (UARS), will provide data vital to the understanding of ozone depletion, transformation of greenhouse gases, and radiative forcing of climate change.

In addition to science-related passive service applications, research and experiments in use of the 275 to 1 000 GHz band for various active service applications has also been underway for some time. Although the propagation characteristics of the band within the earth's atmosphere (i.e., absorption and scattering) limit the usable range of most active systems compared to their use in lower frequency bands, there are also some benefits. These include an increase in range and angular resolution for radiolocation applications, resulting in the ability to discriminate "targets" that are much closer

together than could be achieved in lower bands. For terrestrial communications, the severe propagation path loss conditions in this band facilitate frequency reuse and increases privacy for those that need it. Also, the bandwidth available in these higher frequency regions provides the opportunity for extremely high data rate communications and high processing gains for spread spectrum systems. Active applications in space are not impacted by the atmosphere and therefore receive the full benefit associated with the use of these higher bands.

Additionally, the Plenipotentiary Conference will be considering Inter American Proposals (IAPs) to remove the 3 000 GHz limit from the note to the definition of "radiocommunication" in the ITU and an accompanying Resolution inviting future World Radiocommunication Conferences to revise the terms and definitions in the Radio Regulations, with a view towards harmonization.

Proposal:

USA/ / 1
MOD

RESOLUTION 801 (WRC-~~200~~03)

~~Preliminary~~ Aagenda for the ~~2005/~~2006 World Radiocommunication Conference

The World Radiocommunication Conference ~~(Istanbul, 2000),~~ (Geneva, 2003),

Reasons: Editorial

resolves to give the view

USA/ / 2 MOD

2.3 to ~~review studies and consider allocations in~~ consider issues related to the frequency bands above 275 GHz~~;~~:

Reasons: To review the issues related to the current and future use of this portion of the frequency spectrum.

USA/ / 3 ADD

2.3.1 to review studies and consider allocations in the frequency bands between 275 GHz and 1 000 GHz to the passive science services, taking account of the needs of other services such as the amateur service;

Reasons: Passive science sensors and radio astronomy are already utilizing frequency bands in the 275 - 1000 GHz region and many more systems are planned for these bands. In the past, the amateur service has often proven to be compatible with these services.

USA/ / 4 ADD

2.3.2 to review studies with a view to identifying future requirements for applications in the frequency bands above 1 000 GHz;

Reasons: Both active and passive services have demonstrated operations above 1000 GHz, and even above the 3 000 GHz limit contained in **1.5** of the Radio Regulations. The proposed change to the ITU Convention (Marrakech, 2002) also necessitates a review of studies addressing spectrum above 3 000 GHz in order to align definitions in the Radio Regulations and by doing so establish a mechanism through which future spectrum issues of an international character can be addressed.

_____

-FCC-